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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/005,193	12/04/2001	Trista P. Chen	200302024-1	6949

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IP Administration, Legal Dept. M/S 35
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EXAMINER	
EHICHIOYA, FRED I	

ART UNIT	PAPER NUMBER
2172	6

DATE MAILED: 07/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/005,193	CHEN ET AL.	
	Examiner	Art Unit	
	Fred I. Ehichioya	2172	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1 - 35 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1 - 10, 18, and 20 - 21 is/are rejected.

7)☒ Claim(s) 19 is/are objected to.

8)☒ Claim(s) 1 - 10, 11 - 17, 18 - 21, and 22 - 35 are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 4.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1 - 35 are pending in this application.

Election/Restrictions

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1 - 10 and 18 - 21, drawn to storing and ordering image data in a database, which is pattern matching and classified in class 707, subclass 6.

II. Claims 11 – 17, and 22 - 35, drawn to finding images in a database which is application of database, e.g. distributed, multimedia and image, and classified in class 707, subclass 104.1.

The inventions are distinct, each from the other because of the following reasons:

3. Inventions listed as Group I and Group II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention has separate utility as follows:

Group I: storing and ordering image data in a database.

Group II: finding images in a database.

See MPEP § 806.05(d).

4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

5. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

6. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

7. During a telephone conversation with Mary Lou Wakimura, Attorney for the Applicant,

registration Number 31,804 on July 7, 2004 a provisional election was made without traverse to prosecute the invention of Group I, claims 1 - 10 and 18 - 21. Affirmation of this election must be made by applicant in replying to this Office action. Claims 11 – 17, and 22 - 35 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

8. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the

inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1 – 5, 8, 9, 18, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S Patent 6,751,343 issued to Regina K. Ferrell et al (hereinafter "Ferrell") in view of U.S. Patent 6,754,667 issued to Whoi-Yul Kim et al (hereinafter "Kim").

Regarding claims 1 and 18, Ferrell teaches a method for storing and retrieving image data comprising:

providing a plurality of match images (see column 5, lines 47 – 50);

mapping into the database to determine a close match of the target descriptor among the organized match descriptors, a close match determined by a distance to a near match descriptor within a predetermined threshold, the mapping further comprising (see column 4, line 64 – column 5, line 37):

selecting a candidate match descriptor from among the organized match descriptors (see column 5, lines 38 – 50);

Ferrell does not explicitly teach computing a match descriptor corresponding to a multidimensional space indicative of each of the match images; organizing each of the match descriptors in a database according to a predetermined similarity metric, the similarity metric operable to indicate match descriptors that are near to other match descriptors in the multidimensional space; receiving a target image for which a match is sought; computing a target descriptor indicative of the target image; and

returning the candidate match descriptor if the candidate match descriptor is a match to the target descriptor, the match being determined by a similarity metric.

Kim teaches computing a match descriptor corresponding to a multidimensional space indicative of each of the match images (see column 3, lines 53 - 57)

organizing each of the match descriptors in a database according to a predetermined similarity metric, the similarity metric operable to indicate match descriptors that are near to other match descriptors in the multidimensional space (see column 6, lines 8 - 20)

receiving a target image for which a match is sought (see column 6, lines 32 – 33);

computing a target descriptor indicative of the target image (see column 6, lines 33 – 36); and

returning the candidate match descriptor if the candidate match descriptor is a match to the target descriptor, the match being determined by a similarity metric (see column 1, lines 19 – 30).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine teaching of Kim with the teaching of Ferrell wherein image descriptors represent the characteristics of the images. The image descriptor includes a color descriptor a texture descriptor and a shape descriptor which respectively describes a color of the image, a texture of the image and a shape of the image. The motivation is that using well-defined image descriptors make the retrieval system more efficient.

Regarding claim 2, Kim teaches a match descriptor is a vector quantity (see column 4, lines 62 – 63).

Regarding claim 3, Kim teaches the correspondence is a similarity of the match descriptors (see column 3, lines 6 – 9).

Regarding claim 4, Ferrell teaches the predetermined metric is a distance metric (see 12, lines 38 – 41).

Regarding claim 5, Kim teaches the distance metric is derived from a similarity metric, the similarity metric operable to determine match descriptors near to other match descriptors based on a distance in the multidimensional space (see column6, lines 8 – 20).

Regarding claim 8, Ferrell teaches the match descriptors are invariant descriptors (see column 7, lines 42 – 43).

Regarding claim 9, Ferrell teaches the invariant descriptors are insensitive to geometric translations (see column 7, lines 43 – 67).

Regarding claim 19, Kim teaches selecting another candidate match descriptor if the candidate match descriptor is not a match to the target descriptor, the selecting occurring from among match descriptors organized near the candidate match descriptors (see column 2, lines 44 – 53).

Regarding claim 20, Kim teaches wherein near match descriptors are similar vectors in the multidimensional space (see column 6, lines 8 – 20).

Regarding claim 21, Kim teaches the similarity metric is a set similarity metric (see column 6, lines 8 – 20).

11. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ferrell in view of Kim and further in view of Non-Patent Literature "Relatives of Fourier transform," The Fourier Transform and Its Applications, McGraw –Hill, New York, NY, pp. 241 – 274 (1978) by Bracewell, R. (hereinafter "Bracewell").

Regarding claim 6, Ferrell or Kim does not explicitly teach Fourier-Mellin.

However, Bracewell teaches computing the match descriptor includes computing a Fourier-Mellin Transform (FMT) (see Pages 241 – 242).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine teaching of Bracewell with the teaching of Ferrell and Kim wherein FMT implores the use of pattern recognition process for the previously designated pattern from a set of data or images. Previously designated pattern is described by invariant descriptors. The motivation is that using Fourier-Mellin Transform facilitates the locating of previously designated pattern.

Regarding claim 7, Bracewell teaches vector quantization of the FMT (see pages257 – 262).

12. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ferrell in view of Kim and further in view of Non-Patent Literature "Similarity search in High Dimensions via Hashing," Proceedings of the 25th VLDB (Very Large Database) Conference, Edinburgh, Scotland, (1999) By Gionis, A. et al (hereinafter "Gionis").

Regarding claim 10, Ferrell or Kim does not explicitly teach Locality-Sensitive Hashing (LSH).

Gionis teaches the organizing according to a predetermined metric further comprises Locality-Sensitive Hashing (LSH) (see sections 3.1 and 3.2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine teaching of Gionis with the teaching of Ferrell and Kim wherein LSH is used to solving memory algorithmic problems. The motivation is that Locality-Sensitive Hashing is more efficient for indexing in high-dimensional data.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred I. Ehichioya whose telephone number is 703-305-8039. The examiner can normally be reached on M - F 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Breene can be reached on 703-305-9790. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Fred I. Ehichioya
Examiner
Art Unit 2172
July 11, 2004

SHAHID ALAM
PRIMARY EXAMINER